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A cartridge gun with a cartridge holder

[0001] The invention relates to a cartridge gun with a cartridge holder according to the preamble of claim 1.

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[0002] Cartridge guns are known which are also designated as cartridge presses and are used for pressing out pasty materials from cartridges, e.g. sealing materials, adhesive materials or the like. Such pressing tools comprise a shell for receiving the cartridge whose shape is adjusted to the external shape of the cartridge. The one face side of the shell is fastened to the handle of the cartridge press. The face side comprises a recess in which the pressure rod with the stamp attached thereto is displaceable. The opposite face side is slotted, so that the tip of the cartridge which comprises a displaceable floor acting as a piston can be placed in said slot. The pressure rod is pushed forward by a gun-like actuating mechanism which comprises an actuating member in the form of a swivelable trigger lever. The rod is moved forward a short step during each triggering movement. For this purpose the actuating mechanism comprises an advancing element which is pushed forward by the manual movement of the actuating member and entrains the rod. When the actuating member is released, the advancing element slides empty back onto the rod.

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[0003] A major disadvantage in said known cartridge holders is their overall size and the thus resulting weight of the cartridge gun. The configuration of the cartridge holder made of sheet metal or the like leads to a relatively high consumption of material. Approximately half the material required for such cartridge presses is used for the construction of the cartridge holder, which obviously has an effect on the overall weight of the cartridge gun. A reduction of the share of material of the cartridge holder and a thus ensuing reduction in the weight is therefore desirable. A further disadvantage of these cartridge holders is that the insertion and removal of the cartridges is cumbersome because they frequently tend to get jammed.

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5 **[0004]** A hand press gun is known from DE G89 01 028.0 in which a screw cap with an inside thread is attached to the face side of a gun grip, into which a threaded ring with an external thread and axial bore is screwed. The cartridge which comprises a flange at the rear end is pushed from behind through the threaded ring until the flange abuts on the rear side of the threaded ring. Thereafter the threaded ring is screwed into the
10 screw cap.

[0005] The publication EP-A2-1 034 847 discloses a cartridge press with a cartridge holder comprising claws whose free ends engage in the outside wall of a cartridge pushed into the holder. The claws dig slightly into the material of the cartridge, so that
15 the cartridge is held in a secure manner. A displaceable sleeve is pressed against the cartridge holder and against the claws for removing the cartridge from the cartridge holder, as a result of which the same releases the cartridge, and the cartridge can be pulled from the cartridge holder.

20 **[0006]** The mentioned hand press guns come with the disadvantage that the exchange of cartridges is cumbersome and time-consuming. A threaded ring or a sleeve needs to be unscrewed first or actuated before the cartridge can be removed from the holder. This manipulation is cumbersome because one would actually require three hands, namely for holding the gun, for unscrewing the threaded ring and pressing the cartridge
25 against the claws, and a further hand for removing the empty cartridge from the cartridge gun.

[0007] The invention is therefore based on the object of providing a cartridge gun with a cartridge holder which requires little material and allows a simple exchange of the
30 cartridges.

[0008] This object is achieved by a cartridge press with the features of claim 1.

[0009] It is the principle of the invention that the cartridge receiver only consists of a
35 base in which the lower end of a cartridge is insertable. Gripping elements are arranged

5 in the base which engage in the inside wall of the inserted cartridge and hold the cartridge. For the purpose of releasing the gripping elements, the piston rod is withdrawn completely until a stamp arranged at the front end of the piston rod presses back the gripping elements from the gripping position and releases the cartridge for removal. The advantage of such a cartridge gun is that the cartridge receiver only
10 consists of a base and does not extend over the entire length of the cartridge to be inserted. Material is saved by omitting a shell construction for the cartridge holder. The overall weight of the cartridge gun can thus be kept low. The cartridge gun further comprises an actuating device for displacing the piston rod, which allows displacing the piston rod in a continuous manner alternating in the forward direction or in the reverse
15 direction. A stamp is arranged at the front end of the piston rod. It comprises a rearward projecting edge. For the purpose of removing a used cartridge, the stamp is retracted with the piston rod until the edge of the stamp rests on the gripping elements arranged in the base of the cartridge holder. The retraction of the stamp occurs either by pulling at the rear end of the piston rod or by multiple pressing of a retraction lever which
20 displaces the piston rod in a rearward direction. By a renewed pressing of the retraction lever, the stamp presses against the gripping elements and detaches the same from their anchoring in the cartridge wall. The cartridge can be removed without any obstructions from the cartridge holder. The removal of a used cartridge from the cartridge gun is substantially simplified with the cartridge gun in accordance with the
25 invention, so that an exchange of the cartridges is facilitated.

A further advantage of the cartridge gun in accordance with the invention is that the actuating device allows a displacement of the piston rod in a continuous manner in the forward and rearward direction. One problem occurring during the pressing out of pasty
30 materials is that a pressure builds up in the cartridge during the advancement of the stamp attached to the piston rod and the pressing against the piston. After the emission of the quantity of pasty mass corresponding to the path of advancement, a subsequent dripping occurs by the pressure relief, so that precise dosing and apportioning is only possible with difficulty. The subsequent dripping can soil the ambient environment. The
35 pressure build-up which causes the subsequent dripping is caused on the one hand by

5 the fact that the medium to be pressed out comprises a certain compressibility and on
the other hand by a certain elastic deformability of the cartridge. Subsequent dripping
can be avoided when the pressure in the cartridge is reduced in time. This can be
achieved by withdrawal of the stamp in time. Once sufficient material has been pressed
out, a short pressing of the retraction lever is sufficient, as a result of which the stamp is
10 slightly withdrawn and no force on the part of the stamp acts on the piston any more.
The problem of subsequent dripping can be avoided with the cartridge gun in
accordance with the invention.

[0010] Further advantages of the invention follow from the dependent claims and the
15 description below, in which the invention is explained in closer detail by reference to an
embodiment schematically shown in the drawings.

[0011] The figures show as follows:

20 Fig. 1 shows a view of a cartridge gun;

Fig. 2 shows a cartridge gun with an inserted cartridge in a sectional view;

Fig. 3 shows an enlarged section according to Fig. 2 with the cartridge holder and the
25 actuating device for displacing the piston rod;

Fig. 4 shows an enlarged section of the cartridge holder with the actuating device for
displacing the piston rod with a completely retracted stamp.

30 **[0012]** The same reference numerals were used for the same elements in the figures.
Declarations for the first time relate to all figures, unless mentioned expressly
otherwise. The terms of front and rear relate to the cartridge gun in which the cartridge
holder is arranged at the front, and rear means the opposite end.

5 **[0013]** Fig. 1 schematically shows a cartridge gun 1. The cartridge gun 1 comprises a housing 7 with a grip 2 and a cartridge holder 3. The advancement and retraction device for displacing the piston rod 4 is arranged in the housing 7, which device can be actuated by pressure triggers. The piston rod 4 is moved forward a short step with each pressure movement on advancement trigger 8, and it is moved a short step backward
 10 following a pressure movement of the retraction trigger 9. A stamp 5 forms the front end of the piston rod 4 and the rear end of the piston rod 4 is provided with a holding knob 6. The holding knob 6 can be used to withdraw the piston rod 4 or it can be pushed into the cartridge up to the cartridge floor.

15 **[0014]** Fig. 2 shows a sectional view of a cartridge gun 1 with a cartridge 10 inserted into the cartridge holder 3. The cartridge 10 is shown without any content and without the cartridge floor which forms the piston. The piston rod 4 has been fully withdrawn. With each pressure movement on the advancement lever 8 in the direction towards the grip 2, the piston rod 4 is pressed slightly forward into the cartridge 10 in the direction of
 20 nozzle 11. In this process, the stamp 5 presses against the piston in the cartridge and presses the pasty material situated in the cartridge outwardly through the nozzle 11. A short pressure on the retraction lever 9 in the direction towards the grip 2 pushes the piston rod 4 a small step backwards, whereupon the piston is relieved and the pressure in the cartridge 10 is reduced. Subsequent dripping can thus be avoided.

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[0015] Fig. 3 shows an enlarged sectional view of Fig. 2 with the cartridge holder 3 and the actuating device in housing 7 for displacing the piston rod 4. The cartridge holder 3 consists of a cylindrical base 12 with an annular groove 14. The outside diameter of the annular groove 14 corresponds to the outside diameter of a cartridge 10, so that the
 30 same can be inserted effortlessly into the annular groove 14 of base 12, and rests on the outside wall of annular groove 14. An axially extending, graduated hole bore 15 in the center of base 12 is used for receiving a hub 16. Gripping elements 17 are clamped between the edge 20 of the collar 18, which is formed by the annular groove 14 and the hole bore 15, and the hub 16. Said gripping elements 17 can be individual claws
 35 projecting into the annular groove 14 whose free ends reach up to the outside wall of

annular groove 14. In the illustrated embodiment, the gripping elements are formed by the jacket surface with longitudinal slots of an element in the shape of a truncated cone. The upper cover surface of the truncated element comprises a bore in such a way that the remaining circular ring of said cover surface can be clamped between hub 16 and the edge 20 of the collar 18. Strip-like gripping elements 17 are obtained by the slots in the jacket surface of the truncated element whose free ends project into the annular groove 14 in the direction of the housing 7 of the cartridge gun 1 up to the outside wall of the annular groove 14 and can be provided with a sharp edged or pointed configuration. In order to ensure sufficient stability and elasticity of the resilient gripping elements 17 it is advantageous when such gripping elements 17 are made of spring steel. Other materials for producing the gripping elements are possible. Once a cartridge 10 is pressed into the base 12 of the cartridge holder 3, the gripping elements 17 press with their free ends against the inside wall 13 of the cartridge 10 and hold the same. As soon as stamp 5 is used to press against the piston in the cartridge 10, a pressure is also exerted on the cartridge 10 which tries to press the cartridge 10 from the cartridge holder 3. This is prevented by the gripping elements 17 which tightly grasp the side wall of the cartridge slightly under this pressure.

[0016] A forward drive disk 21 which is tiltable in the known manner is attached in the housing 7, with the piston rod 4 projecting through its opening. The opening on the forward drive disk 21 is slightly larger than the diameter of the piston rod 4, so that the forward drive disk 21 is freely displaceable along the piston rod 4. The forward feed disk 21 is pressed to the back by the pressure spring 22. The grip 4 comprises an advancement trigger 8 which acts upon the lower side of the forward drive disk 21. As a result of actuating the advancement trigger 8, the forward drive disk 21 is tilted at first forwardly until it presses against the piston rod 4 and gets jammed there, and it is further pressed forward against the pretension force of the pressure spring 22. It forwardly moves the piston rod 4 with the stamp 5. A further tiltable drive disk 24 for the rearward displacement of the piston rod 4 is attached in the housing 7. This retraction drive disk 24 is pressed forwardly by the pressure spring 22. A retraction trigger 9 which can be swiveled about an axis 19 is arranged in the housing 7 for the reverse

displacement of the piston rod 4, which trigger acts upon the lower side of the retraction drive disk 24. The retraction drive disk 24 is tilted in a rearward manner at first by actuating the retraction trigger 9 until it presses against the piston rod 4 and gets jammed there, whereupon it is pushed further back against the pretension force of the pressure spring 22, with the same moving the piston rod 4 with the stamp 5 to the back.

[0017] The piston rod 4 is situated in the illustration in the retracted position, as is the case in a newly inserted cartridge 10. By pressing the advancement trigger 8, the piston rod 4 with the stamp 5 is pressed continuously in the forward direction into the cartridge 10 and against the piston, with the same pressing the pasty mass from the cartridge 10.

Once sufficient material has been ejected from cartridge 10, a short pressure on the retraction trigger 9 is sufficient in order to move the piston rod 4 slightly backwards. As a result, no pressure acts on the piston by stamp 5, and the excess pressure in cartridge 10 is reduced, thus preventing subsequent dripping. The stamp 5 which is arranged at the front end of the piston rod 4 comprises a plane front surface and a rearwardly projecting edge 25 which is slightly sloped at its end 26. The sloping corresponds approximately to the inclination of the gripping elements. For the purpose of removing or exchanging an empty cartridge 10, the piston rod is pushed right to the back. This can be made manually by pulling the piston rod 4 to the back on the knob 6 until the stamp 5 rests with its edge 26 on the gripping elements 17. The retraction of the piston rod 4 can also occur in such a way that the retraction trigger 9 is actuated several times until the stamp 5 is fully retracted. For removing the cartridge 10 from the cartridge holder 3, the cartridge 10 is held with one hand and the retraction trigger 9 is actuated again with the other hand. The sloping end 26 of the edge 26 of stamp 5 presses against the resilient gripping elements 17 which are thus pressed away from the inside wall 13 of the cartridge 10, and the cartridge 10 can be removed from the cartridge holder 3. As soon as the stamp 5 has been pushed in a forward direction again, the resilient gripping elements 17 return to their initial position as a result of their elasticity, which means that the free ends reach up to the inner edge of the circular groove 14 again.

5 **[0018]** Fig. 4 shows an enlarged sectional view of the housing 7 with the cartridge holder 3 and the actuating device for displacing the piston rod 4 when the stamp 5 is fully retracted. The illustration further shows the situation in which the retraction trigger 9 has been pressed and the gripping elements 17 are pressed from the rearward projecting edge 25 of the stamp 5 against the inside, and thus release the boundary
10 region of the annular groove 14, as a result of which the cartridge 10 can be withdrawn from the cartridge holder 3.

15 **[0019]** The embodiment shown in the drawings shows a cartridge gun 1 in which the housing 7 with the grip 2 and the cartridge holder 3 is of an integral configuration and is made of plastic for example. It is also possible that the cartridge gun 1 is composed of individual parts and the base 12 of the cartridge holder 3 is screwed onto the face side of the housing 7.